Nov. 17, 1931. F. J. HOHNHORST 1,831,913

MECHANISM FOR TRUING AND DRESSING GRINDING WHEELS

Original Filed Jan. 31, 1927

Fig. 4.

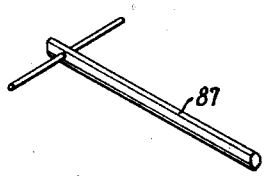


Fig. 1.

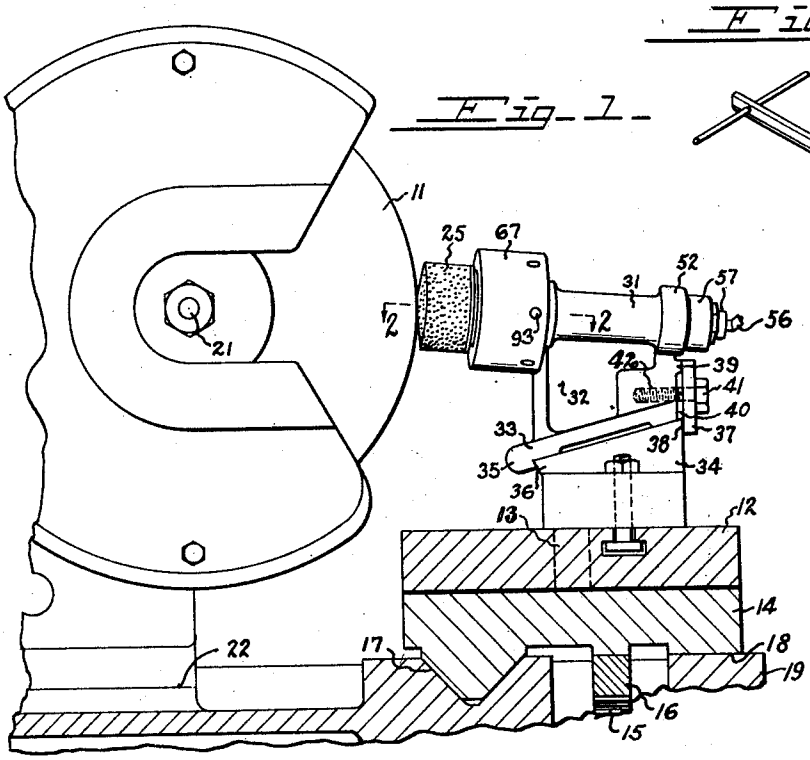


Fig. 3.

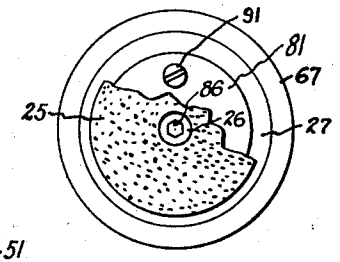
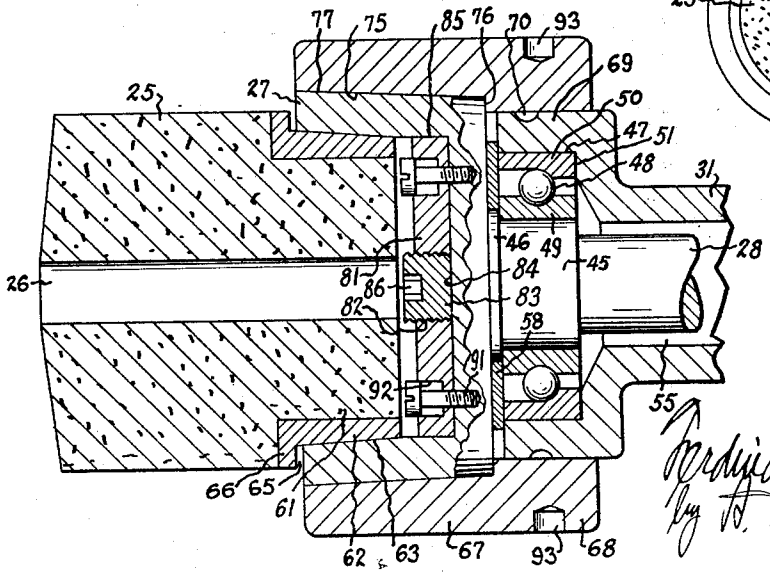


Fig. 2.



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UNITED STATES PATENT OFFICE

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MECHANISM FOR TRUING AND DRESSING GRINDING WHEELS

Original application filed January 31, 1927, Serial No. 164,830. Divided and this application filed October 22, 1928. Serial No. 314,141.

My invention relates to mechanism for truing and dressing grinding wheels, such as emery wheels employed in machinery for grinding or polishing surfaces of metal in precision grinding, and employing a rotary abrading part for truing or dressing the grinding wheel.

It is the object of my invention to provide novel means whereby to secure the rotary abrading part to its holder and for releasing the rotary abrading part from its holder, and the invention will be further readily understood from the following description and claims, and from the drawings, in which latter:

Fig. 1 is a side elevation of my improved device, partly broken away.

Fig. 2 is an axial section of my improved device, taken on a line corresponding to the line 2—2 of Fig. 1, and partly broken away.

Fig. 3 is an end elevation of my improved device, partly broken away, and viewing the interior of the chuck; and

Fig. 4 is a perspective view of the releasing tool.

This application is a division of my application for patent on improvements in mechanism for truing and dressing grinding wheels, filed in the United States Patent Office January 31, 1927, as Serial No. 164,830, issued as Patent No. 1,708,575, April 9, 1929.

My invention is exemplified as employed in connection with a so-called grinding or polishing machine employing a rotary grinding wheel 11 for effecting the grinding or polishing.

The grinding or polishing machine may be of any suitable or ordinary construction, and may for example comprise suitable means, such as usual centers, for supporting the work during the grinding, and be provided with a table 12, pivotally mounted by a pivot 13 on a saddle 14, which has lateral reciprocating motion imparted thereto by power means in usual manner, as by a pinion 15, suitably driven, meshing with a rack 16 extending lengthwise of the saddle and fixed to the saddle. The saddle is slidable on guideways 17, 18, on the frame 19 of the machine.

The grinding wheel 11 is suitably fixed to a shaft 21 journaled in bearings of a slide 22, adjustable toward and from the work-table 12 by any suitable means, the adjusted slide being arranged to be clamped by suitable means to the frame 19. The grinding wheel is rotatable by suitable power means.

I have instanced the abrading part as acting on the grinding wheel during the absence of work between the usual centers of the machine.

The rotary abrading part is exemplified as an abrading nib, stub or pencil 25, hereinafter referred to as a nib. The abrading nib is preferably of a texture harder than the grinding wheel and of substantially smaller diameter than the diameter of the grinding wheel on which it operates. The abrading nib is exemplified as presented endwise to the grinding wheel to coact with the grinding surface of the grinding wheel. It is shown provided with an axial bore 26, which coincides with the axis of rotation of the abrading nib.

The abrading nib is shown received in a chuck 27, which is part of or rigidly secured to a spindle 28. The spindle is journaled in suitable manner in a barrel 31, shown as part of a frame 32 which comprises a base 33, suitably secured to an adapter plate 34, adjustably positioned lengthwise of the table 12. The base 33 is provided with a lug 35 along one of its edges, shaped to match an engaged edge 36 of the adapter plate. A clamping finger 37 coacts with the other engaged edge 38 of the adapter plate, and is anchored on a lug 39 on the base, for providing a space 40 between the clamping finger and the rear end of the base. A clamp bolt 41 is received through a hole in the clamping finger and is threaded into a threaded hole 42 in the base for clamping the base to the adapter plate in suitable positions along the adapter plate.

The spindle 28 is provided with an enlargement 45, at the outer end of which there is a shoulder 46, formed between the enlargement 45 and the chuck 27. The barrel 31 is provided with an internal annular rabbet 47. A ball-bearing 48 is located between said enlargement and the walls of said rabbet.

and is preferably a radial and end thrust ball-bearing. The inner raceway 49 of this ball-bearing is positioned on the enlargement 45 by the shoulder 46. The outer raceway 50 of said ball-bearing is positioned in the annular rabbet 47, the inner end of said raceway being held by the shoulder 51 forming the inner wall of said annular rabbet.

There is a ball-bearing between the other end of said spindle and said barrel, similar to the ball-bearing 48, but reversely positioned in an enlargement 52 of the barrel.

There is a space, indicated generally at 55, extending throughout the barrel and between the balls and raceways of the ball-bearings, forming a lubricant space which may be filled with lubricant, for instance a heavy oil, so that all moving parts in the barrel may be thoroughly lubricated. The lubricant may be supplied through a usual lubricant nipple 56 secured to a cap 57 at the outer end of the barrel and communicating with said space. A washer 58, which may be of absorbent material, is located between the chuck 27 and the adjacent end of the barrel.

The rotary abrading part, exemplified as the nib, is normally quiescent. Rotation is imparted to the abrading nib by contact with the rotating grinding wheel. The abrading nib is presented toward the grinding wheel in such relation as to cause coaction between the abrading nib at one side of its axis of rotation and the rotating grinding wheel.

The rotary abrading nib is preferably provided with the axial bore 26, so as to avoid the formation of a hump or point of resistance of abrading material at and immediately adjacent to the axis of rotation of the rotary abrading part, thereby avoiding streaks or scars or marring of the grinding surface of the grinding wheel, and insuring accurate truing and dressing of said grinding surface.

The body of this nib is preferably formed of closely united and hard abrading material which is not readily machined, but may be of other structure, and is provided with a shank 61, about which there is a collar 62 of machineable material, for instance Babbitt-metal, which is poured or molded about the shank so as to have fixed relation thereto and to form a stem, by means of which the nib may be readily held in the chuck.

The means for securing the nib in the chuck are in the present exemplification shown as comprising a socket 63 in the chuck, which has an inwardly contracting tapering wall, the outer periphery of the collar 62 about the shank being similarly tapered, and being complemental to the inner tapered wall of the socket of the chuck, for forming intimate connection therewith, and for clampingly holding the abrading nib in the chuck. When the abrading nib is firmly seated in the chuck, there is still preferably an annular space 65 between the annular shoulder 66 at the inner end of the rotary nib and the outer end of the wall of the socket of the chuck.

In order to provide maintenance of rotation of the rotary abrading part and smoothness of operation and accurate work between it and the grinding surface of the grinding wheel, a fly-wheel effect is provided for the chuck, instanced as an enlargement of the chuck, as by providing a fly-wheel collar 67 for the chuck. This collar has a rearward annular extension 68 received about the stationary tubular end 69 of the barrel 31 and the bearing 48 in said barrel. This tubular end may be provided with an annular groove 70 for oil or as an air-cushion.

The collar is received about the chuck and is rigidly secured thereto. This is effected by providing the collar with an internal slightly inwardly tapered bore 75, preferably terminating at a shoulder 76, and by providing the outer face of the chuck with a complemental tapered outer periphery 77. The collar is received about the chuck and the chuck firmly wedged therein to form a rigid structure.

Means are provided for readily releasing the rotary abrading nib from its chuck, instanced as accomplished by an extractor plate 81, provided with a central threaded bore 82. An extractor bolt 83 is threaded in said bore, and is arranged to be resisted by the inner wall 84 of the chuck socket.

The extractor plate is axially movable in the inner socket portion 85 of the chuck, which is preferably cylindrical. The extractor bolt is provided with a socket 86, which is formed in cross-section so as to receive and be turned by a suitable tool, exemplified at 87. The coacting faces of the wrench and socket 86 are shown polygonal in cross-section. The shank of the wrench is received through the bore 26 in the abrading nib for coaction with the extractor bolt, and the extractor bolt is turned with relation to the extractor plate, for moving the extractor plate away from the bottom of the socket, for exerting extracting force upon the abrading nib in the socket, for removing the abrading nib from the socket. Upon extraction of the abrading nib, the extractor plate is again moved toward the bottom of the clutch socket out of the way of the nib to be placed in the clutch socket.

Relative rotation between the extractor plate and the clutch is prevented, for instance by means of retaining screws 91 received through holes in the extractor plate and threaded in the bottom of the socket of the chuck, these retaining screws being provided with heads normally received in enlargements 92 of the holes in the extractor plate

for maintaining the etxraction plate in the socket.

The combined chuck and fly-wheel is preferably provided with radial holes 93, for receiving a suitable spanner wrench, for holding the chuck against rotation during rotation of the extractor bolt for moving the extractor plate.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is:

1. In mechanism of the character described, the combination with an end-contact rotary abrading nib, of a chuck provided with a socket in which said rotary abrading nib is received, an extractor plate in said socket, means for urging said extractor plate outwardly, for releasing said abrading nib, means retaining said extractor plate in said socket, said rotary abrading nib having an axial bore adapted to have a tool insertible inwardly thereinto for coaction with said means for urging said extractor plate outwardly for releasing said abrading nib.

2. In mechanism of the character described, the combination with an end-contact rotary abrading nib having a central bore, of a nib-receiving chuck comprising a chuck socket having an inner wall, having an outer tapered portion and an inner cylindrical portion, an extractor plate in said cylindrical portion of said socket, a threaded plug in line with said central bore having operative connection with said extractor plate and with said inner wall and arranged by rotation thereof to force said nib outwardly and thereby extract the same from said socket, said central bore adapted to receive a tool through its outer end arranged to coact with said threaded plug for rotating said plug, and means retaining said extractor plate in said cylindrical portion.

3. In mechanism of the character described, the combination with an end-contact rotary abrading nib having an axial bore, of a nib-receiving chuck comprising a chuck socket having an inner wall, an extractor plate in said socket, a threaded plug in line with said bore having operative connection with the axial portion of said extractor plate and with said inner wall and arranged by rotation thereof to force the nib outwardly and thereby extract the same from said socket, said bore adapted to receive a tool into coaction with said threaded plug for rotating said plug, and means for restricting rotation of said extractor plate in said socket to force relative rotation between said threaded plug and said extractor plate.

4. In mechanism of the character described, the combination of a chuck, and a rotary abrading nib having an end-contact abrading face and a tapered holding end, said chuck having a tapered socket in which said tapered holding end is clampingly received, means between the bottom of said socket and said tapered holding end comprising an extractor plate coacting with the inner end of said nib and a bolt threaded in the axial portion of said extractor plate coacting with the bottom of said socket for forcing said tapered holding end outwardly in said socket to release said abrading nib, said bolt having a recess adapted to receive an extracting tool, and said rotary abrading nib having an axial bore in which said tool is adapted to be received for coaction with said last-named means, said bolt being of greater diameter than said bore and said recess being of less diameter than said bore, for forcible extraction of the clamped tapered end of said rotary abrading nib from said tapered socket.

5. In mechanism of the character described, the combination of a chuck, a rotary abrading nib having an end-contact abrading face and a tapered holding end, said chuck having a tapered socket in which said tapered holding end is clampingly received, a nib-extracting part in said socket arranged to act on said nib axially to push said nib forcibly outward from its clamped relation in said socket to release said nib, retaining means retaining said nib-extracting part in said socket, said rotary abrading nib provided with an axial bore, through which a tool is adapted to be received for coaction with said nib-extracting part for extracting said nib.

In testimony whereof, I have hereunto signed my name.

FERDINAND J. HOHNHORST.